(12) UK Patent Application (19) GB (11) 2 088 996 A

(21) Application No 8130552
(22) Date of filing 9 Oct 1981
(30) Priority data
(31) 80/32869
(32) 10 Oct 1980
(33) United Kingdom (GB)
(43) Application published 16 Jun 1982
(51) INT CL³ F16F 9/04
(52) Domestic classification F2S 101 114 BD
(56) Documents cited
GB 1471416
GB 1433224
GB 1210783
GB 1094842
GB 951816
GB 804394
GB 303004
(58) Field of search F1D F2S
(71) Applicant
Gordon Lloyd Pumphrey, Camelot, 38 Sea Front Road, Hayling Island, Hants., United Kingdom
(72) Inventor
Gordon Lloyd Pumphrey
(74) Agents
F. J. Cleveland & Company, 40—43 Chancery Lane, London WC2A 1JQ

# (54) Inflatable Anti-vibration Mounting

(57) An inflatable anti-vibration mounting includes a housing 1 having a base member 2 and an upstanding wall portion 3, at least one inflatable toroidal chamber 4 located within the housing 1 intermediate the base member 2 and a planar member 5 supported by the toroidal chamber 4 and on which is mounted the equipment or machinery 6 whose vibrations are to be damped by the mounting.

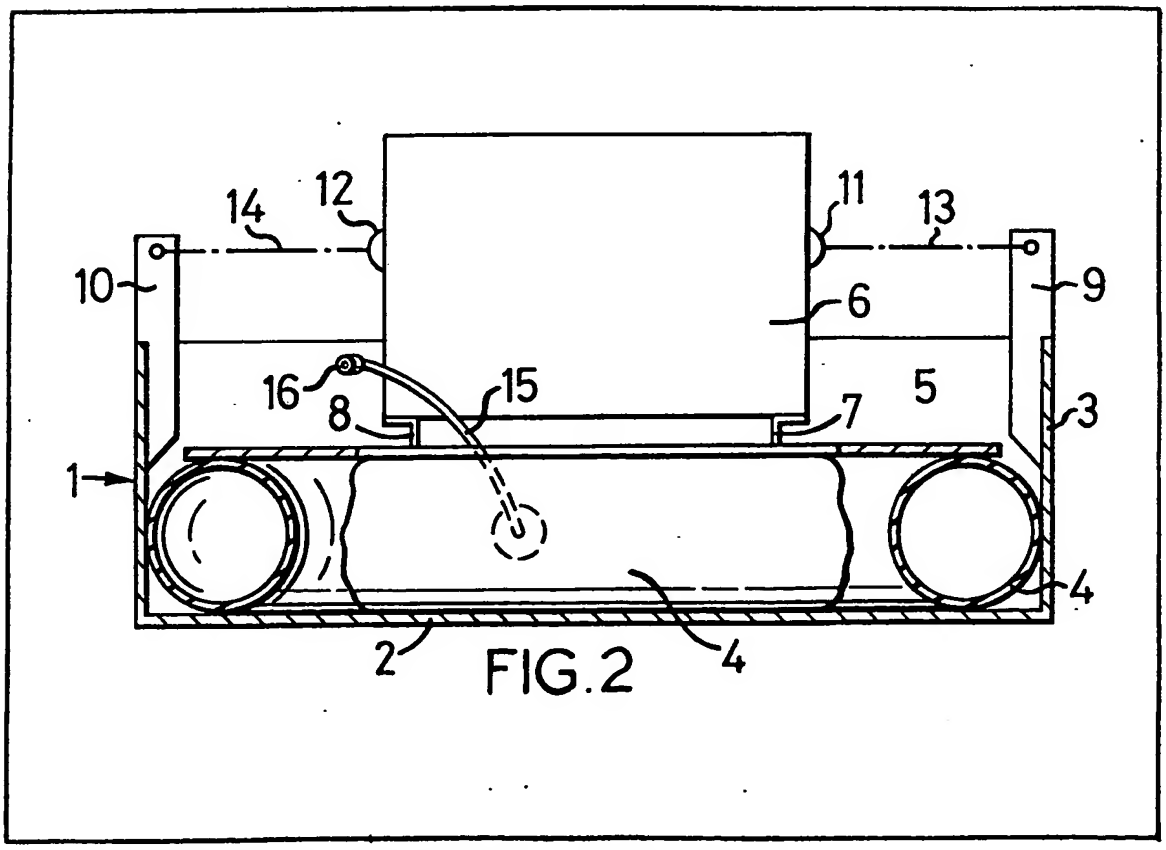


FIG.2

GB 2 088 996 A

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

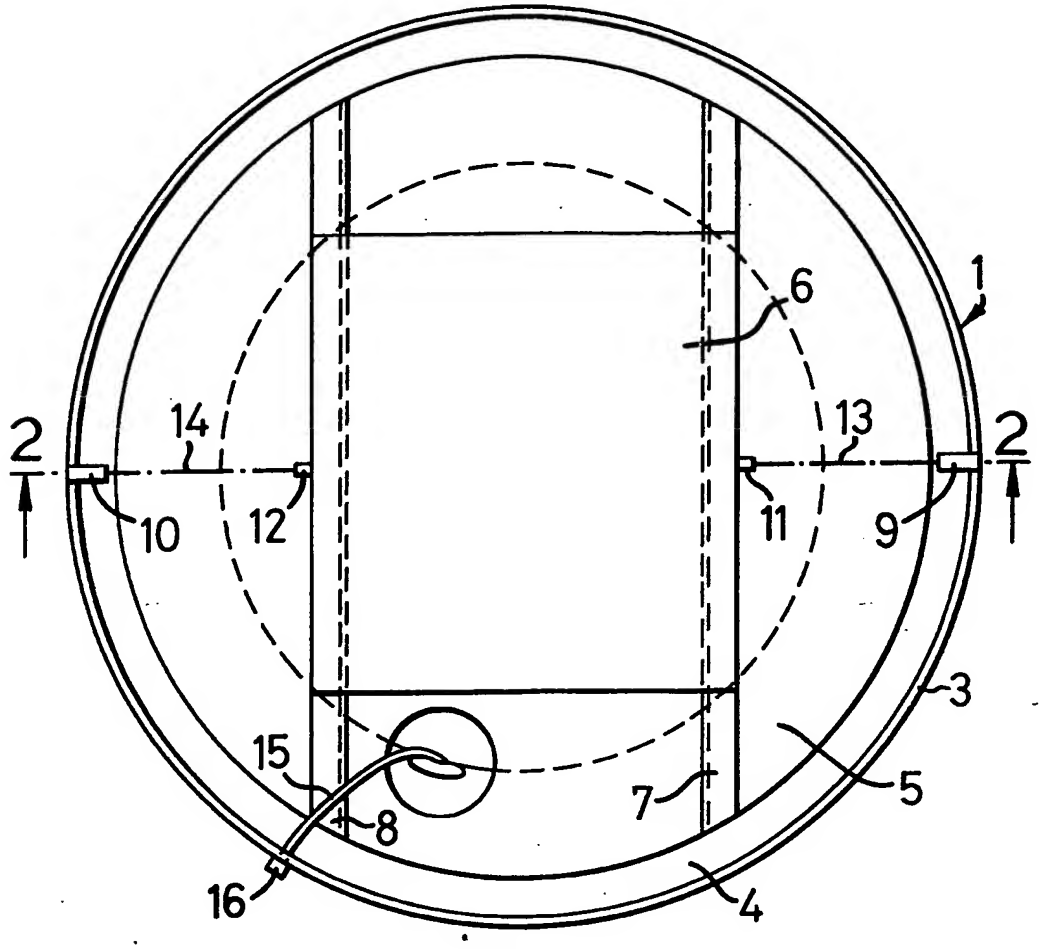


FIG.1

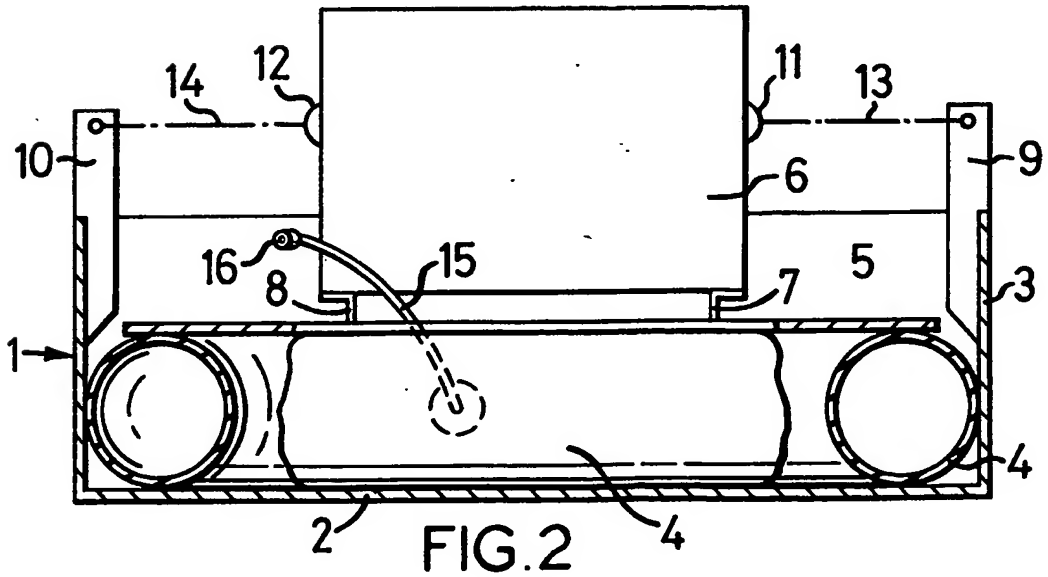


FIG.2

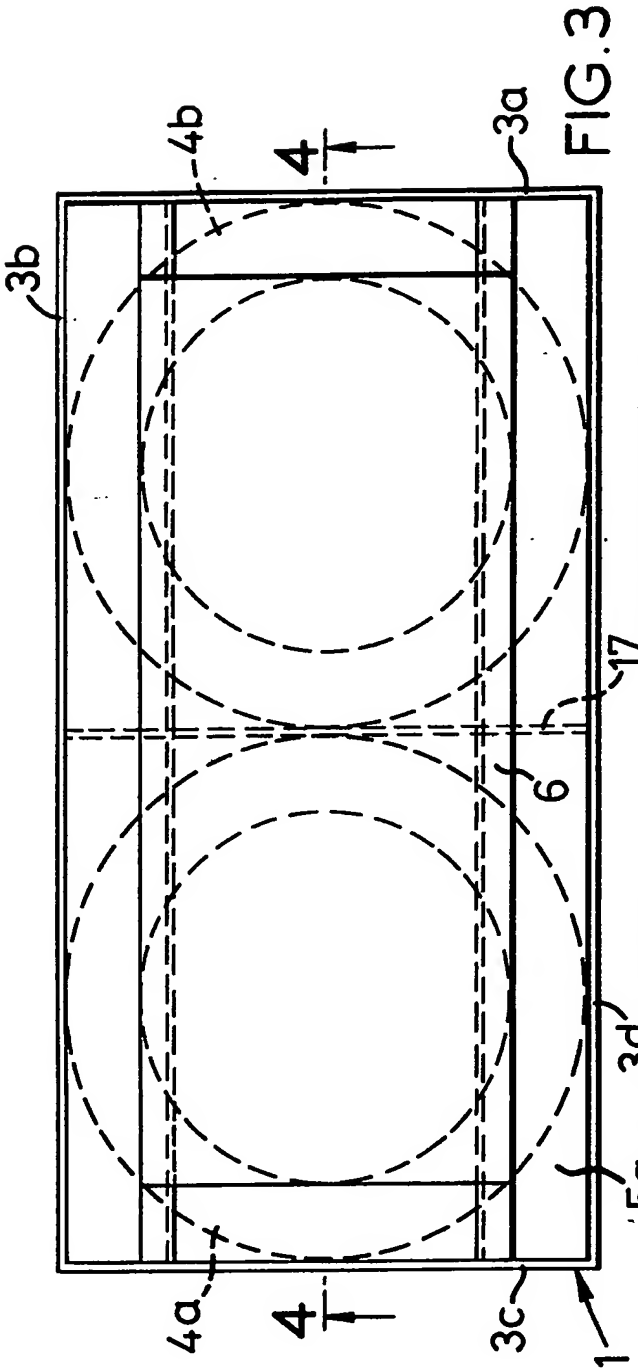


FIG.3

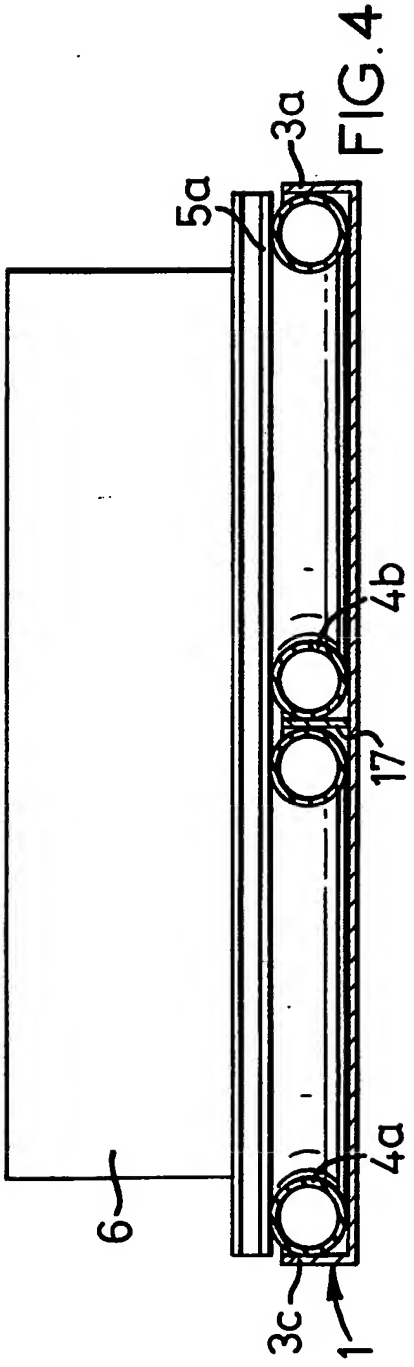


FIG.4

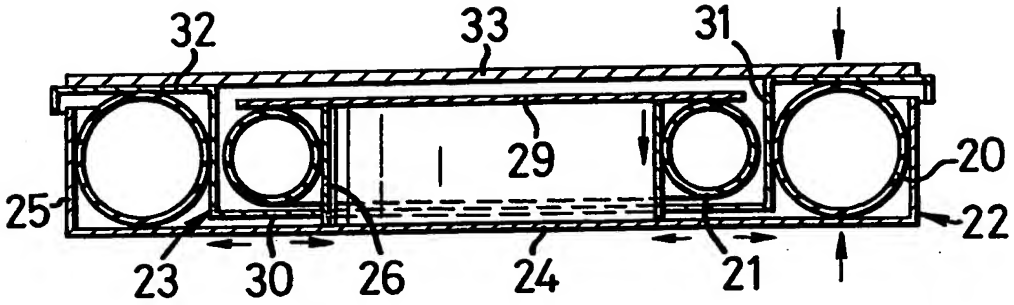


FIG.5

SPECIFICATION
**Inflatable Anti-vibration Mounting**

This invention relates to anti-vibration mountings, and particularly, but not exclusively to anti-vibration mountings for heavy machinery such as a diesel engine where vibration is excessively high and requires to be damped.

According to the invention, there is provided an anti-vibration mounting comprising a housing having a horizontal base member and an upstanding vertical wall surrounding the base member, a planar member spaced from the base member of the housing and at least one inflatable toroidal member located within the housing intermediate the undersurface of the planar member and the base member of the housing.

In one embodiment of the invention, the housing has a circular horizontal base member formed with an integral upstanding vertical peripheral wall within which is located a single toroidal pneumatically inflatable chamber located between the base member of the housing and a circular planar member supported by the inflatable chamber and also located within the housing wall but spaced therefrom, the planar member being arranged to support the machinery or equipment subjected to or responsible for the vibrations to be damped by the anti-vibration mounting of the invention. A vertical inner wall may extend between the upper planar member and the base member of the housing within the space defined by the inner periphery of the inflatable chamber, and concentric therewith.

In another embodiment of the invention, the housing is of rectangular form with a base member and an upstanding vertical wall portion along each side of the base member. Two inflatable toroidal chambers are located within the housing in side-by-side relationship with a partition wall between the two chambers. A single rectangular planar member extends over both chambers and on which the machinery or equipment is mounted.

In a further embodiment of the invention, a captive anti-vibration mounting is provided by locating two concentric inflatable toroidal chambers within an outer housing provided with upstanding walls, a second housing being located intermediate the outer housing and a planar load bearing surface, the two chambers being such that one contains the load and the other acts to maintain the mounting plate on its base.

The invention will now be described by way of example only with particular reference to the accompanying informal drawings wherein:

Figure 1 is a plan view of a circular anti-vibration mounting of the present invention;

Figure 2 is a sectional view taken on the lines 2—2 of Figure 1;

Figure 3 is a plan view of another embodiment of the invention showing two inflatable chambers incorporated in a rectangular anti-vibration mounting;

Figure 4 is a section taken on the lines 4—4 of Figure 3 and

Figure 5 is a sectional view of a further embodiment of the invention showing two concentric inflatable chambers of a circular anti-vibration mounting of the invention.

Referring to Figures 1 and 2, the anti-vibration mounting comprises a cylindrical housing 1 having a base 2 and peripheral wall 3. Within the housing 1 and forming a reasonably tight fit therein is a pneumatically inflatable toroidal chamber 4 of flexible material, e.g. rubber. The chamber 4 is located within the housing 1 intermediate the base 2 of the housing and a circular planar member 5 supported by the toroidal chamber 4. The machinery or equipment 6 such as a diesel engine whose vibrations are required to be damped, is mounted on the planar member 5 and supported on spaced angle section members 7, 8. The wall 3 of the housing 1 extends beyond the upper surface of the planar member 5 and is provided with a pair of diametrically opposed brackets 9, 10. The machinery or equipment 6 is provided with a pair of anchoring points 11, 12, to allow tie members 13, 14 such as wires to extend between the brackets 9, 10 and anchoring points 13, 14, to restrain or inhibit excess movement of the machinery or equipment 6 in both the vertical and horizontal planes. Inflation of the chamber 4 is effected by means of a connector 15 and valve member 16 arranged to be coupled to a suitable air supply (not shown).

Instead of a single inflatable chamber, at least two concentric chambers may be located within the housing and the size and number of chambers employed and the internal pressure thereof will depend upon the size and weight of the machinery or equipment to be supported.

In another embodiment of the invention illustrated in Figures 3 and 4, the housing 1 is of rectangular form with peripheral walls 3*a*, 3*b*, 3*c*, 3*d*. Two toroidal inflatable chambers 4*a*, 4*b* are located within the housing 1, the outer periphery of each chamber being in contact with three walls of the housing and with an intermediate wall portion 17. A rectangular planar member 5*a* is supported by the inflatable chambers 4*a*, 4*b* and the planar member 5*a* supports the machinery or equipment 6.

Referring to Figure 5, two concentric inflatable toroidal chambers 20, 21 are located within a pair of housings 22, 23. An outer housing 22 comprises a circular base member 24 having a peripheral wall 25 and an inner wall 26 surmounted by an upper circular planar portion 29. A second housing 23 includes a base portion 30 centrally located within the housing 22 and having an upstanding peripheral wall 31 intermediate the two chambers 20, 21, the wall 31 having a horizontal lip or rim 32 extending outwardly over the top of the outer and larger inflatable chamber 20. The planar load bearing surface 33 supporting the machinery or equipment (not shown) rests on the rim or lip 32

of the inner housing 23. A loose bolt (not shown) may be located between the upper planar portion 29 and the load bearing surface 33, such that no vibration is transmitted therethrough.

The outer chamber 20 is of larger diameter and volume compared with that of chamber 21, the latter always being smaller or containing less pressure than the outer chamber 20. The arrangement shown in Figure 5 provides a captive anti-vibration mounting. With both chambers inflated, the outer tube acts to contain the load whilst the inner tube acts to maintain the mounting plate on the load bearing surface. The two chambers are preferably inflated from separAte pressure sources, and if the outer chamber should lose pressure, the inner chamber will always maintain the mounting within its base.

The housing may be of any suitable material such as mild steel, fibre glass or may be of cast metal. Furthermore, although the invention has been particularly described with reference to pneumatically inflatable chambers, any hydraulic or pneumatic inflatable chamber of toroidal form may be used. With multi-chamber mountings, all inflatable chambers may be commonly vented in order to ensure a uniform pressure for each or the fluid supply for each chamber may be separate allowing compensation for differential loading across each mounting.

## Claims

1. An anti-vibration mounting comprising a housing having a horizontal base member and an upstanding vertical wall surrounding the base member, a planar member spaced from the base member of the housing and at least one inflatable toroidal member located within the housing intermediate the undersurface of the planar member and the base member of the housing.

2. An anti-vibration housing as claimed in claim 1 wherein the housing is of cylindrical form and the said at least one toroidal member is located between the base member of the housing and a circular planar member.

3. An anti-vibration housing as claimed in claims 1 or 2 wherein a plurality of toroidal members are located concentrically within the housing.

4. An anti-vibration housing as claimed in claim 1 wherein the housing is of rectangular construction with at least two toroidal members located in side-by-side relation within the housing, an intermediate wall extending from the base member of the housing between adjacent toroidal members and a single planar member extending over all toroidal members.

5. An anti-vibration mounting as claimed in claim 1 and comprising an outer housing having an upstanding outer vertical wall enclosing an outer of a pair of toroidal inflatable members, and an inner vertical wall around the inner periphery of the inner of the pair of toroidal members, a planar member surrounding the inner vertical wall, and an inner housing located within the outer housing and having an upstanding vertical wall located between the inner and outer toroidal members and having a horizontal lip projecting externally from the vertical wall thereof, and a planar load bearing surface located on the lip of the inner housing.

6. An anti-vibration mounting as claimed in claim 5 wherein the outer toroidal member is of larger diameter and volume compared with that of the inner toroidal member.

7. An anti-vibration mounting as claimed in claim 6 wherein the outer toroidal member is inflated to a higher pressure than the inner toroidal member.

8. An anti-vibration mounting substantially as hereinbefore described and as shown in Figures 1 and 2 or Figures 3 and 4 or Figure 5 of the accompanying drawings.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1982. Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.